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Rockfall Episodes from Visual and Seismic Data Analysis at Stromboli Volcano, Italy

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On 30 December, 2002, huge subaerial and submarine landslides (Bonaccorso et al., 2003) occurred at Stromboli volcano, Italy, two days after a renewal of the effusive activity. As a consequence of the landslides and concurrent tsunami waves, which threatened the safety of the inhabitants of the island (Pino et al., 2004), the attention of the scientific community has been drawn on sliding processes affecting the instable flanks of the Sciara del Fuoco in the western part of the volcano (e.g., Maiolino et al., 2004). We analyze rockfall episodes which have been continuing to occur despite the end of the lava effusion in July 2003. Particularly, we propose a comparative analysis of visual and seismic data recorded in 2004. Our data set encompasses records of the seismic network, along with concurrent visual images of permanent video cameras - in continuous acquisition - run by INGV, pointing from a site at 400 m above see level to the summit part of the volcano. Excluding night-time hours and days with bad weather conditions and/or when the vapor emission hindered the view, we find that only a few seismic traces refer to rockfall episodes which are not visible on the field. This finding allows us to explore the characteristics of the rockfalls in a new perspective, integrating visual and seismic data. Additionally, this comparative analysis sheds light on the sliding process, considering the material involved and possible cause-and-effect relationships with seismic-shaking and eruptive activity.